PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-140078

(43)Date of publication of application : 17.05.2002

---

(51)Int.Cl. G10K 15/02
G10L 19/00

---

(21)Application number : 2000-332483 (71)Applicant : SONY CORP

(22)Date of filing : 31.10.2000 (72)Inventor : ANDO KAZUTAKA
TANGE AKIRA

---

(54) DEVICE AND METHOD FOR INFORMATION PROCESSING, PROGRAM RECORDING MEDIUM, AND DATA RECORDING MEDIUM

(57)Abstract:

PROBLEM TO BE SOLVED: To make developable a new market and provide new services by enabling users to mutually sell and buy improvement information for improving the quality of data that they themselves bought.

SOLUTION: In a management center 4, user information including user identification information for identifying a user terminal 2 and improvement identification information for discriminating improvement information recorded on an optical disk 10 processed by the user terminal 2 is registered. At the management center 4, one user terminal 2m which can provide necessary improvement information when another user terminal 2k makes a request for improvement information through a network 4 is retrieved according to the user information and the improvement information is

obtained from the retrieved user terminal 2m through the network 3. Then the management center 4 provides the obtained improvement information for the user terminal 2k through the network 3.

LEGAL STATUS [Date of request for examination] 15.03.2007
[Date of sending the examiner's decision of rejection]
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]
[Date of final disposal for application]
[Patent number]
[Date of registration]
[Number of appeal against examiner's decision of rejection]
[Date of requesting appeal against examiner's decision of rejection]
[Date of extinction of right]

CLAIMS

[Claim(s)]

[Claim 1] An improvement information-requirements means to be the information processor which processes the data set which consists of data used as the object which raises quality, and improvement information for raising the data quality, and to require the improvement information on other one or more data sets, The information processor characterized by having the upgrading means which raises the data quality of said data set using the improvement information acquired as a result of the demand by said improvement information-requirements means, and the improvement information on said data set.

[Claim 2] The data of said data set are an information processor according to claim 1 characterized by being what restored to the original data by degrading

the original data quality and using the improvement information on the data set, and the improvement information on other at least one data set.

[Claim 3] Said improvement information is an information processor according to claim 1 characterized by being what can raise said data quality more, so that the improvement information on more numbers gathers.

[Claim 4] It is the information processor according to claim 1 which the data of said data set carry out subsampling of the original data, and is characterized by said improvement information being the thing of a certain phase of the data obtained by changing the data of said origin and carrying out subsampling of the phase.

[Claim 5] It is the information processor according to claim 1 which the data of said data set are the high order bit of the original data, and is characterized by said improvement information being a part of lower bit of the data of said origin.

[Claim 6] Said improvement information is an information processor according to claim 1 characterized by being a part of prediction coefficient used for the operation which calculates the forecast of the data which raised the data quality of said data set.

[Claim 7] The information processor according to claim 1 characterized by

having further an offer means to provide other information processors with the improvement information on said data set.

[Claim 8] The improvement information-requirements step which is the information processing approach of processing the data set which consists of data used as the object which raises quality, and improvement information for raising the data quality, and requires the improvement information on other one or more data sets, The information processing approach characterized by having the upgrading step which raises the data quality of said data set using the improvement information acquired as a result of the demand by said improvement information-requirements step, and the improvement information on said data set.

[Claim 9] The processing of a data set which consists of data used as the object which raises quality, and improvement information for raising the data quality The improvement information-requirements step which is the program documentation medium by which the program made to perform to a computer is recorded, and requires the improvement information on other one or more data sets, The program documentation medium characterized by recording the program equipped with the upgrading step which raises the data quality of said

data set using the improvement information acquired as a result of the demand by said improvement information-requirements step, and the improvement information on said data set.

[Claim 10] The information processor characterized by to have a playback means is the information processor which processes the data set which consists of data used as the object which raises quality, and improvement information for raising the data quality, and reproduce the improvement information on said data set, and an offer means offer the improvement information reproduced in said playback means according to the demand of other information processors.

[Claim 11] The data of said data set are an information processor according to claim 10 characterized by being what restored to the original data by degrading the original data quality and using the improvement information on the data set, and the improvement information on other at least one data set.

[Claim 12] Said improvement information is an information processor according to claim 10 characterized by being what can raise said data quality more, so that the improvement information on more numbers gathers.

[Claim 13] It is the information processor according to claim 10 which the data of said data set carry out subsampling of the original data, and is characterized by

said improvement information being the thing of a certain phase of the data obtained by changing the data of said origin and carrying out subsampling of the phase.

[Claim 14] It is the information processor according to claim 10 which the data of said data set are the high order bit of the original data, and is characterized by said improvement information being a part of lower bit of the data of said origin.

[Claim 15] Said improvement information is an information processor according to claim 10 characterized by being a part of prediction coefficient used for the operation which calculates the forecast of the data which raised the data quality of said data set.

[Claim 16] The information-processing approach characterized by to have the playback step which is the information-processing approach of processing the data set which consists of data used as the object which raises quality, and improvement information for raising the data quality, and reproduces the improvement information on said data set, and the offer step which offer the improvement information reproduced in said playback step according to the demand of other information processors.

[Claim 17] The processing of a data set which consists of data used as the

object which raises quality, and improvement information for raising the data quality The playback step which is the program documentation medium by which the program made to perform to a computer is recorded, and reproduces the improvement information on said data set, The program documentation medium characterized by recording the program equipped with the offer step which offers the improvement information reproduced in said playback step according to the demand of other information processors.

[Claim 18] As opposed to the user terminal which processes the data set which consists of data used as the object which raises quality, and improvement information for raising the data quality The user-identification information which is the information processor which acquires and offers the improvement information on other data sets from other user terminals, and identifies a user terminal, A registration means to register User Information containing the improvement information identification information which identifies the improvement information on the data set processed in the user terminal, A retrieval means to search other user terminals which can offer required improvement information when there is a demand of improvement information from a user terminal based on said User Information, The information processor

characterized by having an acquisition means to acquire improvement information, and an offer means to provide the user terminal which has required the improvement information with the improvement information acquired in said acquisition means, from other user terminals searched in said retrieval means.

[Claim 19] The data of said data set are an information processor according to claim 18 characterized by being what restored to the original data by degrading the original data quality and using the improvement information currently recorded on self, and the improvement information on other at least one data set.

[Claim 20] Said improvement information is an information processor according to claim 18 characterized by being what can raise said data quality more, so that the improvement information on more numbers gathers.

[Claim 21] It is the information processor according to claim 18 which the data of said data set carry out subsampling of the original data, and is characterized by said improvement information being the thing of a certain phase of the data obtained by changing the data of said origin and carrying out subsampling of the phase.

[Claim 22] It is the information processor according to claim 18 which the data of said data set are the high order bit of the original data, and is characterized by

said improvement information being a part of lower bit of the data of said origin.

[Claim 23] Said improvement information is an information processor according to claim 18 characterized by being a part of prediction coefficient used for the operation which calculates the forecast of the data which raised the data quality of said data set.

[Claim 24] It is the information processor according to claim 18 which said acquisition means acquires two or more different improvement information from two or more of other user terminals of each, and is characterized by said offer means offering said two or more different improvement information.

[Claim 25] The information processor according to claim 18 characterized by having further an accounting means to perform accounting which pays the countervalue to the improvement information about other user terminals which acquired improvement information with said acquisition means.

[Claim 26] Said accounting means is an information processor according to claim 25 characterized by performing accounting according to the needs of said improvement information.

[Claim 27] The information processor according to claim 18 characterized by having further an accounting means to perform accounting which collects the

countervalue to the improvement information about the user terminal which offered improvement information with said offer means.

[Claim 28] Said accounting means is an information processor according to claim 27 characterized by performing accounting according to the needs of said improvement information.

[Claim 29] As opposed to the user terminal which processes the data set which consists of data used as the object which raises quality, and improvement information for raising the data quality The user-identification information which is the information processing approach of acquiring and offering the improvement information on other data sets from other user terminals, and identifies a user terminal, The registration step which registers User Information containing the improvement information identification information which identifies the improvement information on the data set processed in the user terminal, The retrieval step which searches other user terminals which can offer required improvement information when there is a demand of improvement information from a user terminal based on said User Information, The information processing approach characterized by having the acquisition step which acquires improvement information, and the offer step which provides the

user terminal which has required the improvement information with the improvement information acquired in said acquisition step from other user terminals searched in said retrieval step.

[Claim 30] As opposed to the user terminal which processes the data set which consists of data used as the object which raises quality, and improvement information for raising the data quality The user-identification information which is the program documentation medium by which the program to which the information processing which acquires and offers the improvement information on other data sets from other user terminals is made to carry out to a computer is recorded, and identifies a user terminal, The registration step which registers User Information containing the improvement information identification information which identifies the improvement information on the data set processed in the user terminal, The retrieval step which searches other user terminals which can offer required improvement information when there is a demand of improvement information from a user terminal based on said User Information, The acquisition step which acquires improvement information from other user terminals searched in said retrieval step, The program documentation medium characterized by recording the program equipped with the offer step

which provides the user terminal which has required the improvement information with the improvement information acquired in said acquisition step.

[Claim 31] The data-logging medium which is a data-logging medium by which data are recorded, and is characterized by recording the improvement information for raising the data quality recorded on other data-logging media with the data quality currently recorded on self.

[Claim 32] Said data are a data-logging medium according to claim 31 characterized by being what restored to the original data by degrading the original data quality and using the improvement information currently recorded on self, and the improvement information currently recorded on other at least one data-logging medium.

[Claim 33] Said improvement information is a data-logging medium according to claim 31 characterized by being what can raise said data quality more, so that the improvement information on more numbers gathers.

[Claim 34] It is the data-logging medium according to claim 31 which the data currently recorded on said data-logging medium carry out subsampling of the original data, and is characterized by said improvement information being the thing of a certain phase of the data obtained by changing the data of said origin

and carrying out subsampling of the phase.

[Claim 35] It is the data-logging medium according to claim 31 which the data currently recorded on said data-logging medium are the high order bit of the original data, and is characterized by said improvement information being a part of lower bit of the data of said origin.

[Claim 36] Said improvement information is a data-logging medium according to claim 31 characterized by being a part of prediction coefficient used for the operation which calculates the forecast of the data which raised the data quality currently recorded on said data-logging medium.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a data-logging medium at the information processor and the information processing approach of enabling it to perform dealing of the improvement information for raising the data quality which are users and self purchased etc. about a data-logging medium in an information processor and the information processing approach, a program documentation medium, and a list, a program documentation medium, and a list.

[0002]

[Description of the Prior Art] In the former, although musical piece data were recorded on record media, such as CD (Compact Disc), and it was provided for the user, in recent years, the service which offers the contents of musical piece

data and others through a network by the spread of the Internet, advance of compression/extension technique, etc. is spreading, for example.

[0003]

[Problem(s) to be Solved by the Invention] Structure which deals in the data which the user purchased under this environment by users, Namely, to for example, record media, such as CD, and the musical piece data which a user purchases through a network The improvement information for raising the tone quality of the musical piece data which other users purchase is added, and if there is structure which deals in the improvement information by users further, it will be expected that exploitation and new service of a new commercial scene are born.

[0004] This invention is made in view of such a situation, are users and enables it to perform dealing of the improvement information for raising the data quality which self purchased etc.

[0005]

[Means for Solving the Problem] The 1st information processor of this invention is characterized by having the upgrading means which raises the data quality of a data set using an improvement information-requirements means to require the

improvement information on other one or more data sets, the improvement information acquired as a result of the demand by the improvement information-requirements means, and the improvement information on a data set.

[0006] The 1st information processing approach of this invention is characterized by having the upgrading step which raises the data quality of a data set using the improvement information-requirements step which requires the improvement information on other one or more data sets, the improvement information acquired as a result of the demand by the improvement information-requirements step, and the improvement information on a data set.

[0007] The 1st program documentation medium of this invention is characterized by recording the program equipped with the upgrading step which raises the data quality of a data set using the improvement information-requirements step which requires the improvement information on other one or more data sets, the improvement information acquired as a result of the demand by the improvement information-requirements step, and the improvement information on a data set.

[0008] The 2nd information processor of this invention is characterized by having a playback means to reproduce the improvement information on a data set, and

an offer means to offer the improvement information reproduced in the playback means according to the demand of other information processors.

[0009] The 2nd information processing approach of this invention is characterized by having the playback step which reproduces the improvement information on a data set, and the offer step which offers the improvement information reproduced in the playback step according to the demand of other information processors.

[0010] The 2nd program documentation medium of this invention is characterized by recording the program equipped with the playback step which reproduces the improvement information on a data set, and the offer step which offers the improvement information reproduced in the playback step according to the demand of other information processors.

[0011] The user-identification information from which the 3rd information processor of this invention discriminates a user terminal, A registration means to register User Information containing the improvement information identification information which identifies the improvement information on the data set processed in the user terminal, A retrieval means to search other user terminals which can offer required improvement information when there is a demand of

improvement information from a user terminal based on User Information, It is characterized by having an acquisition means to acquire improvement information, and an offer means to provide the user terminal which has required the improvement information with the improvement information acquired in the acquisition means, from other user terminals searched in the retrieval means.

[0012] The user-identification information from which the 3rd information processing approach of this invention discriminates a user terminal, The registration step which registers User Information containing the improvement information identification information which identifies the improvement information on the data set processed in the user terminal, The retrieval step which searches other user terminals which can offer required improvement information when there is a demand of improvement information from a user terminal based on User Information, It is characterized by having the acquisition step which acquires improvement information, and the offer step which provides the user terminal which has required the improvement information with the improvement information acquired in the acquisition step from other user terminals searched in the retrieval step.

[0013] The user-identification information from which the 3rd program

documentation medium of this invention discriminates a user terminal, The registration step which registers User Information containing the improvement information identification information which identifies the improvement information on the data set processed in the user terminal, The retrieval step which searches other user terminals which can offer required improvement information when there is a demand of improvement information from a user terminal based on User Information, It is characterized by recording the program equipped with the acquisition step which acquires improvement information, and the offer step which provides the user terminal which has required the improvement information with the improvement information acquired in the acquisition step from other user terminals searched in the retrieval step.

[0014] The data-logging medium of this invention is characterized by recording the improvement information for raising the data quality recorded on other data-logging media with the data quality currently recorded on self.

[0015] In a program documentation medium, the improvement information on other one or more data sets is required of the 1st information processor of this invention and the information processing approach, and a list, and the data quality of a data set improves using the improvement information acquired as a

result of the demand, and the improvement information on a data set.

[0016] The improvement information on a data set is reproduced by the 2nd information processor of this invention and the information processing approach, and the list in a program documentation medium, and the reproduced improvement information is offered according to the demand of other information processors.

[0017] User Information containing the 3rd information processor of this invention and the information processing approach, the user-identification information that identifies a user terminal in a program documentation medium in a list, and the improvement information identification information which identifies the improvement information on the data set processed in the user terminal is registered. Moreover, other user terminals which can offer required improvement information when there is a demand of improvement information are searched from a user terminal based on User Information, and improvement information is acquired from the user terminal of the searched others. And the user terminal which has required the improvement information is provided with the acquired improvement information.

[0018] In the data-logging medium of this invention, the improvement information

for raising the data quality recorded on other data-logging media with the data quality currently recorded on self is recorded.

[0019]

[Embodiment of the Invention] Drawing 1 shows the example of a configuration of the gestalt of 1 operation of the network system (a system means the object with which two or more equipments gathered logically, and it does not ask whether the equipment of each configuration is in the same case) which applied this invention.

[0020] The contents provider 1 provides each user (a user terminal 21 thru/or 2 Ns) for example, with the musical piece data as contents with improvement information which is mentioned later. In addition, although there are an approach of offering when the contents provider 1 transmits musical piece data through the networks 3, such as a public network, and a CATV network, the Internet, as the approach of providing a user, for example, and the approach of offering by recording on the record media 10, such as CD, it explains for the musical piece data recorded on below by the record medium 10.

[0021] Each reproduces 2Ns (it is described as the limitation and user terminal 2 which do not need to be distinguished the following) of musical piece data

recorded on the user terminal 21 thru/or the record medium 10 purchased from the contents provider 1. Moreover, the improvement information for raising the tone quality of the musical piece data currently recorded on other record media is recorded on the record medium 10 on which the musical piece data which the contents provider 1 offers were recorded with the musical piece data quality, and a user terminal 2 performs improvement processing which raises the tone quality of the reproduced musical piece data using the improvement information, and outputs musical piece data.

[0022] Furthermore, a user terminal 2 acquires improvement information other than the improvement information currently recorded on the record medium 10 which a user owns from the management center 4 through a network 3 according to a demand of a user, and performs improvement processing also using the improvement information. Moreover, a user terminal 2 provides other user terminals 2 with the improvement information currently recorded on the record medium 10 which a user owns via the management center 4 according to the demand from the management center 4.

[0023] The management center 4 relays the exchange of the improvement information between user-terminal 2 through a network 3 (agency). Moreover,

the management center 4 also performs accounting of the countervalue to the improvement information exchanged among user-terminal 2.

[0024] Next, drawing 2 shows the format of the data stream of the musical piece data which the contents provider 1 offers. In addition, drawing 2 shows the format of the data stream about the musical piece data of one music by one contents, i.e., the gestalt of this operation.

[0025] The data stream which the contents provider 1 offers consists of data sets which consist of contents identification information, contents, improvement information identification information, improvement information, etc.

[0026] The contents identification information arranged at the head is the information for identifying the contents arranged following it, and when contents are musical piece data, ISRC (International Standard Recording Code) etc. can be used for it as contents identification information.

[0027] Here, drawing 3 shows the format of ISRC.

[0028] By ISRC, while a country code is indicated to be 6-bit data "L1" each by "L2", an owner code is shown by data "L3" 6 bits each thru/or "L5." Moreover, while a record year is indicated to be 4-bit data "L6" each by "L7", a record serial number is shown by data "L8" 4 bits each thru/or "L12."

[0029] If drawing 2 is followed at return and contents identification information, the musical piece data as contents specified by the contents identification information are arranged. After contents, improvement information identification information is arranged and this improvement information identification information expresses the type of the improvement information arranged after that.

[0030] That is, the contents provider 1 divides the improvement information which raises the tone quality of the musical piece data as contents, and arranges two or more improvement information of each acquired as a result of the division to another data stream. That is, about predetermined musical piece data, the contents provider 1 divides improvement information, constitutes the two or more type data stream which made each improvement information after the division accompany predetermined musical piece data, and provides.

[0031] Therefore, in order to raise to max the tone quality of the musical piece data arranged at a certain type of data stream, the improvement information arranged at the data stream of all the types constituted about the musical piece data is needed.

[0032] Thus, in order to raise the tone quality of a certain musical piece data to

max, the improvement (arranged at data stream) information on all types is required, and improvement information identification information expresses the type of the improvement information arranged after that.

[0033] After improvement information identification information, the improvement information on a type expressed by the improvement information identification information is arranged.

[0034] In addition, in the gestalt of operation of drawing 3 , although improvement information was arranged after musical piece data, it arranges in the middle of a musical piece data [for example,] front, or it divides and improvement information can be dispersedly arranged in each location of musical piece data. Moreover, improvement information can also be embedded for example, into musical piece data using techniques, such as an electronic watermark.

[0035] Next, improvement information is explained with reference to drawing 4 thru/or drawing 9 .

[0036] For example, now, the original data of a certain musical piece data presuppose that it consists of 16 bits, as shown in drawing 4 (A). In addition, the n-th bit is expressed as B#n -1 from the most significant bit among these 16 bits.

[0037] In this case, the original data of 16-bit musical piece data are divided into for example, 6 bit B0 thru/or B5, and 10 bit [of low order] B6 of high orders thru/or B15. Furthermore, 10 bit B6 of low order thru/or B15 are divided into five sets of every 2 bits B6, B7 and B8, B9 and B10, B11, B12 and B13, and B14 and B15, and let this five-set group [2-bit] be the improvement information on each type. And as shown in drawing 4 (B) thru/or drawing 4 (F), the data stream of five types is constituted by the data of a certain musical piece 6 bits of high orders by adding each improvement information on five above-mentioned types to the musical piece data considering B0 thru/or B5 as musical piece data used as contents.

[0038] B6, B7 and B8, B9 and B10, B11 and B12, and B13, B14 and B15 -- respectively -- since -- the tone quality of musical piece data can be raised more, so that the number of the improvement information to acquire will increase, if the becoming improvement information is acquired in that sequence. [in this case,]

[0039] In addition, in the gestalt of operation of drawing 4 , 2 bits used as improvement information are adopted as 2 bits of low order of the 6-bit musical piece data used as contents, and it is possible in a user terminal 2 to treat musical piece data as 8-bit data. However, about the musical piece data with

which improvement information other than B6 and the improvement information on B7 serves as 2 bits of low order in this case, 2 bits (improvement information) of that low order are equivalent to a noise.

[0040] Moreover, in the above-mentioned case, simply, it divides 10 bits of low order into 2 bits at a time, and was made to make it into the improvement information on five types, and it is also possible to divide 10 bits of low order into five 10-bit data which return to the original value by adding, and to make it into the improvement information on five types. Furthermore, 10 bits which becomes improvement information also in this case are adopted as 10 bits of low order of the 6-bit musical piece data used as contents, and it is possible in a user terminal 2 to treat musical piece data as 16-bit data.

[0041] Next, in the gestalt of operation of drawing 4 , although the improvement information which raises the resolution (gradation) of the level direction of musical piece data was explained, it is possible to, adopt what raises the resolution of the direction of time amount of for example, musical piece data in addition to this as improvement information.

[0042] That is, for example, as shown in drawing 5 , supposing the original data of a certain musical piece data are sampled at intervals of time amount TS, as

shown in drawing 6 thru/or drawing 9 , they can change a phase, can carry out subsampling of the original data at intervals of time amount 4TS, and can adopt four subsampling results obtained as a result as the musical piece data and improvement information on four types arranged to a data stream. In this case, when tone quality improves and all the improvement information on four types gathers as the improvement information on each type is acquired, tone quality will serve as best.

[0043] In addition, since musical piece data and improvement information are in agreement in the case of the gestalt of operation of drawing 5 thru/or drawing 9 , in the data format of drawing 2 , either musical piece data (contents) or the improvement information can be omitted.

[0044] Moreover, in order to only prevent the nonconformity as mentioned above since nonconformities, such as aliasing, arise if a subsample result is offered as musical piece data, generally it is desirable to filter a subsample result by LPF (Low Pass Filter) etc. However, if each of four subsample results are filtered, it will become difficult to restore the original original data only by collecting the four subsample results. Then, it is desirable to obtain the data near original data which perform the following class classification adaptation processings in a user

terminal 2 in this case, using four filtered subsample results.

[0045] Namely, class classification adaptation processing consists of class classification processing and adaptation processing, and performs adaptation processing for data for every class part opium poppy and class by class classification processing based on the property.

[0046] In adaptation processing, the musical piece data which raised the time amount resolution of the low resolution data by calculating the forecast of the musical piece data (suitably henceforth high resolution data) of the high resolution which raised time amount resolution by the linear combination of musical piece data (suitably henceforth low resolution data) with low time amount resolution (resolution of the direction of time amount) and a predetermined prediction coefficient, for example are obtained.

[0047] While using a certain high resolution data as educator data now, specifically The low resolution data (subsample result of high resolution data) which degraded the time amount resolution of the high resolution data are used as student data. It considers asking for forecast [of the high resolution data y] E [y] with the primary linearity joint model to which it is specified by the set of some low resolution data x1, x2, and ..., and the predetermined prediction coefficients

w1 and w2 and the linear combination of ... In this case, forecast E [y] can be expressed with a degree type.

[0048]

E [y] =w1x1+w2x2+ ..... (1)

[0049] It is [Equation 1] about matrix Y' which becomes by the matrix X which becomes by the set of the matrix W which becomes by the set of a prediction coefficient wj, and the student data xij in order to generalize a formula (1), and the set of forecast E [yj].

If a definition is come out and given, the following observation equations will be materialized.

[0050] XW=Y' ... (2)

Here, the component xij of Matrix X means the j-th student data in the student data aggregate (student data aggregate used for prediction of the educator data yi of the i-th affair) of the i-th affair, and the component wj of Matrix W expresses

the prediction coefficient which a product with the j-th student data in the student data aggregate calculates. Moreover, yi expresses the educator data of the i-th affair, therefore E [yi] expresses the forecast of the educator data of the i-th affair. In addition, y in the left part of a formula (1) omits the suffix i of the component yi of Matrix Y, and x1 in the right-hand side of a formula (1), x2, and ... also omit the suffix i of the component xij of Matrix X.

[0051] And it considers applying a least square method to this observation equation, and asking for forecast E [y] near the high resolution data y. In this case, it is [Equation 2] about the matrix E which becomes by the set of the matrix Y which becomes by the set of the true value y of the high resolution data used as educator data, and the remainder e of forecast E [y] to the true value y of high resolution data.

If a definition is come out and given, the following remainder equations will be materialized from an equation (2).

[0052] XW=Y+E ... (3)

[0053] In this case, the prediction coefficient wj for asking for forecast E [y] near the true value y of high resolution data is a square error [several 3].

It can ask by making it min.

[0054] Therefore, it will be called an optimum value, when what differentiated the above-mentioned square error with the prediction coefficient wj is set to 0, namely, in order that the prediction coefficient wj which fills a degree type may ask for forecast E [y] near the true value y of high resolution data.

[0055]

[Equation 4]

... (4)

[0056] Then, a degree type is first materialized by differentiating a formula (3) with a prediction coefficient wj.

[0057]

[Equation 5]

... (5)

[0058] A formula (6) is obtained from a formula (4) and (5).

[0059]

[Equation 6]

... (6)

[0060] Furthermore, if the relation of the student data xij in the remainder equation of an equation (3), a prediction coefficient wj, the educator data yi, and Remainder ei is taken into consideration, the following normal equations can be obtained from an equation (6).

[0061]

[Equation 7]

... (7)

[0062] In addition, the normal equation having shown in the equation (7) is [Equation 8] about Matrix (covariance matrix) A and Vector v.

It is formula AW=v, when Vector W is defined as several 1 showed while coming out and giving a definition... (8)

It can come out and express.

[0063] Each normal equation in an equation (7) can build only the same number as several J of the prediction coefficient wj for which it should ask because only a certain amount of number prepares the set of the student data xij and the educator data yi, therefore it can ask an equation (8) for the optimal prediction coefficient wj about Vector W by solution Lycium chinense (however, in order to solve an equation (8), the matrix A in an equation (8) needs to be regular). In addition, in solving a formula (8), it is possible to sweep out and to, use law (method of elimination of Gauss-Jordan) etc. for example.

[0064] It asks for the optimal prediction coefficient wj as mentioned above, and adaptation processing asks for forecast E [y] near the true value y of high resolution data by the formula (1) further using the prediction coefficient wj.

[0065] Here, although adaptation processing is not included in low resolution data, it is the point that the component contained in high resolution data is reproduced, for example, differs from mere interpolation processing. That is, in adaptation processing, as long as a formula (1) is seen, it looks identically to the interpolation processing using the so-called interpolation filter, but since [for which the prediction coefficient w equivalent to the tap multiplier of the

interpolation filter uses the educator data y] it asks by study so to speak, the component contained in high resolution data is reproducible. From this, adaptation processing can be called processing which has a resolution creation operation so to speak.

[0066] Moreover, although the case where time amount resolution was raised was made into the example and adaptation processing was explained here, according to adaptation processing, it is possible to aim at improvement in the resolution of for example, the level direction by changing the educator data and student data which are used for asking for a prediction coefficient.

[0067] In addition, class classification adaptation processing can be used when asking for the data near original data from four filtered subsample results, as mentioned above, and also it can be used as improvement processing which raises a musical piece data quality.

[0068] As improvement processing, when adopting class classification processing, as improvement information, a prediction coefficient is employable and also it is possible to, adopt the selection pattern of the low resolution data which perform a sum-of-products operation with a prediction coefficient according to a formula (1) for example. Moreover, although some low resolution

data are chosen and a class division of low resolution data is performed in the class classification in class classification adaptation processing based on the distribution pattern of the level of that low resolution data etc., it is also possible to adopt the selection pattern of the low resolution data used for this class classification as improvement information. Furthermore, although a class division of low resolution data is performed in a class classification based on the level of low resolution data itself, the difference of level, etc., it is also possible to adopt the approach of the class classification as improvement information.

[0069] Moreover, although aimed at the musical piece data which are audio data with the gestalt of this operation as contents which raise quality, as contents which raise quality, when adopting image data as contents, it is possible [it is possible to adopt image data etc. in addition to this, and] to adopt a motion vector and a DCT (Discreate CosineTransfom) multiplier as improvement information which raises the image quality of an image. That is, it is possible to adopt the lower bit and the high order DCT multiplier of the motion vector used for a motion compensation in the image data as contents when carrying out DCT processing and providing, a motion compensation and as improvement information.

[0070] Next, although the contents provider 1 offers the record medium 10 with which the data stream of a format as shown in drawing 2 was recorded, he explains that production process in case this record medium 10 is an optical disk with reference to the flow chart of drawing 10 .

[0071] In the contents provider 1, first, the glass substrate of a disc configuration is washed, it progresses to step S2 in step S1, and a photoresist is formed on the glass substrate. Then, it progresses to step S3, and the photoresist formed on the glass substrate is cut according to the data stream recorded on an optical disk (exposure), and it progresses to step S4. In step S4, the photoresist cut at step S3 is developed, it progresses to step S5, and electric conduction processing is performed to the photoresist after development. And it progresses to step S6, nickel electrocasting is performed to the glass substrate with which the photoresist after electric conduction processing was formed, and, thereby, La Stampa (nickel) is constituted. Then, it progresses to step S7 and the duplicate of an optical disk is created using La Stampa which consisted of a step S6.

[0072] Next, with reference to drawing 11 , it outlines about the exchange of the improvement information between user-terminal 2 performed via the

management center 4 of drawing 1 .

[0073] In addition, the user terminal which offers user-terminal 2k and improvement information for the user terminal which receives offer of improvement information suitably hereafter is described to be 2m of user terminals, respectively.

[0074] First, user-terminal 2k to receive offer of improvement information requires improvement information of the management center 4 through a network 3. From user-terminal 2k, if a demand of improvement information is received, the management center 4 will search 2m of user terminals which have required improvement information, and will require improvement information through a network 3 from 2m of the user terminal. 2m of user terminals transmits improvement information to the management center 4 through a network 3 according to a demand of the improvement information from the management center 4. The management center 4 receives this improvement information, and transmits it to user-terminal 2k through a network 3.

[0075] In addition, although the improvement information from 2m of user terminals is relayed and he is trying to transmit to user-terminal 2k in the management center 4 with the gestalt of operation of drawing 11 , improvement

information can also be made to transmit to user-terminal 2k directly through a network 3 from 2m of user terminals.

[0076] Moreover, improvement information can also be enciphered and transmitted [also transmitting as it is or] although it is possible. It is also possible to adopt any of the secret key cryptosystem-ized method represented by the public-key-encryption-ized method represented by the RSA (Rivest Shamir Adleman) method etc., the DES (Data Encryption Standard) method, etc. as a cipher system, for example.

[0077] Next, drawing 12 shows the example of a configuration of the user terminal 2 of drawing 1 . In addition, drawing 12 shows the example of a configuration of the user terminal 2 in case the record medium 10 which the contents provider 1 offers is an optical disk.

[0078] The optical disk (it is hereafter indicated also as an optical disk 10 suitably) as a record medium 10 rotates at the rate of predetermined by the spindle motor section 31. In addition, by the roll control signal from CD processor section 34, revolution actuation of the spindle motor section 31 is carried out so that the rotational speed of an optical disk 10 may turn into a predetermined rate.

[0079] The laser beam which had the quantity of light controlled is irradiated

from an optical pickup 32 by the optical disk 10. This laser beam is reflected with an optical disk 10, and incidence of that reflected light is carried out to the photodetection section (not shown) of an optical pickup 32. The photodetection section of an optical pickup 32 is constituted using the division photodetector, by photo electric translation and current potential conversion, generates the voltage signal according to the reflected light, and supplies it to RF (Radio Frequency) amplifier section 33.

[0080] In the RF amplifier section 33, based on the voltage signal from an optical pickup 32, a read-out signal (the so-called sum signal), a focal error signal, and a tracking-error signal are generated, and CD processor section 34 is supplied.

[0081] In CD processor section 34, based on the focal error signal from the RF amplifier section 33, the focal control signal for controlling the objective lens (not shown) of an optical pickup 32 is generated so that the focal location of a laser beam may turn into a location of the recording layer of an optical disk 10, and a driver 35 is supplied. Moreover, based on the tracking-error signal from the RF amplifier section 33, CD processor section 34 generates the tracking control signal for controlling the objective lens of an optical pickup 32 so that the exposure location of a laser beam may turn into a mid gear of a desired truck,

and it supplies it to a driver 35. Furthermore, CD processor section 34 generates the thread control signal for moving an optical pickup 32 in the direction of a path of an optical disk 10, and supplies it to the thread motor section 36 so that the exposure location of a laser beam may not exceed a tracking control range. The thread motor section 36 moves an optical pickup 32 in the direction of a path of an optical disk 10 based on the thread control signal from CD processor section 34.

[0082] Similarly a driver 35 generates a tracking driving signal based on the tracking control signal from CD processor section 34 while generating a focal driving signal based on the focal control signal from CD processor section 34. This focal driving signal and a tracking driving signal are supplied to the actuator (not shown) of an optical pickup 32, and the location of an objective lens is controlled based on these signals. That is, thereby, the laser beam which an optical pickup 32 outputs is controlled to connect a focus with the mid gear of a desired truck.

[0083] Moreover, CD processor section 34 performs asymmetry amendment and binary-izing of the read-out signal from the RF amplifier section 33, and changes them into a digital signal. Furthermore, CD processor section 34 performs CIRC

(Cross Interleave Reed-Solomon Code) error correction processing while performing the EFM (Eight to Fourteen Modulation) recovery of this digital signal etc.

[0084] The musical piece data as contents obtained by performing error correction processing in CD processor section 34 are supplied to the contents storage section 37, and are memorized (record). Moreover, the contents identification information obtained by performing error correction processing in CD processor section 34, improvement information identification information, and improvement information are supplied to the improvement information storage section 38, and are memorized (record).

[0085] Here, from the read-out signal from the RF amplifier section 33, based on the signal, CD processor section 34 also performs detection of the signal for taking frame synchronization, and it generates a roll control signal so that an optical disk 10 may serve as a desired rotational speed, and it supplies it to the spindle motor section 31.

[0086] the improvement processing section 39 performs improvement processing which raises the tone quality of the musical piece data as contents memorized by the contents storage section 37, and the musical piece data which

carried out reading appearance of the improvement information memorized by the improvement information storage section 38, and carried out reading appearance from the contents storage section 37 using the improvement information which carried out reading appearance from the improvement information-storage section 38. And the improvement processing section 39 carries out D/A (Digtal Analog) conversion, and outputs the musical piece data which are obtained by performing improvement processing and whose tone quality improved from the loudspeaker which is not illustrated.

[0087] Here, as mentioned above, as improvement information, two or more types exist and improvement processing which raises the tone quality of musical piece data may be unable to be performed only for a certain type of improvement information. That is, if it, for example, does not have bit B6 of a high order thru/or B13 from it as improvement information even if it has B14 and B15 which are a low-ranking bit more in using what divided the lower bit of the original data of musical piece data into plurality as drawing 4 explained, tone quality of musical piece data cannot be raised. Then, the improvement processing section 39 performs improvement processing, only when improvement information required to raise tone quality is memorized by the improvement information storage

section 38, and when required improvement information is not memorized, it outputs it to the musical piece data memorized by the contents storage section 37, without performing especially improvement processing.

[0088] In addition, the type of improvement information can be recognized by the improvement information identification information memorized by the improvement information storage section 38, and the improvement processing section 39 recognizes whether improvement information required for improvement processing is memorized by the improvement information storage section 38 based on this improvement information identification information.

[0089] The communications control section 40 performs communications control through a network 3. That is, the communications control section 40 requires required improvement information of the management center 4 through a network 3. Furthermore, the communications control section 40 receives the improvement information transmitted from the management center 4 to the demand, and the improvement information storage section 38 is made to supply and memorize it. Moreover, the communications control section 40 reads the improvement information memorized by the account of improvement information 100 million section 38 according to the demand from the management center 4,

and transmits to the management center 4 through a network 3.

[0090] In addition, in a user terminal 2, when acquiring the musical piece data which the contents provider 1 offers through a network 3, in the communications control section 40, the data stream shown in drawing 2 is received. And like the case where playback of an optical disk 10 is performed, musical piece data are supplied to the contents storage section 37, and are memorized, and contents identification information, improvement information identification information, and improvement information are supplied to the improvement information storage section 38, and are memorized.

[0091] The control unit 42 and the display 43 are connected to the control section 41. A control unit 42 is operated, when setting up actuation of a user terminal 2 or switching actuation. That is, if a control unit 42 is operated, a control section 41 is supplied, and the manipulate signal corresponding to the actuation will generate a control signal to a control section 41 based on the manipulate signal, and will supply a required block. Thereby, a user terminal 2 is controlled to operate a request (processing). A status signal is supplied to a display 43 from a control section 41, and, thereby, a display 43 displays the operating state of user-terminal equipment 2, and other required information on

it.

[0092] Next, while receiving offer of improvement information from other user terminals 2 via the management center 4, in order for a user terminal 2 to receive the service which provides other user terminals 2 with improvement information, it is necessary to perform user registration in the management center 4 beforehand.

[0093] Then, with reference to the flow chart of drawing 13 , a user terminal 2 explains registration demand processing in which user registration is required, to the management center 4.

[0094] If a user operates a control unit 42 so that registration demand processing may be performed, a control section 41 will display on a display 43 the message which requires the set of an optical disk 10. And if the user of a user terminal 2 sets an optical disk 10 to a user terminal 2, by the user terminal 2, playback of an optical disk 10 is performed, and while musical piece data are memorized by the contents storage section 37, thereby, contents identification information, improvement information identification information, and improvement information will be memorized by the improvement information storage section 38.

[0095] Then, a control section 41 makes the communication link between the

management centers 4 through a network 3 establish by controlling the communications control section 40.

[0096] And in step S11, the communications control section 40 reads the contents identification information and improvement information identification information which were memorized by the improvement information storage section 38, and includes these in the registration demand message which requires user registration. Furthermore, the telephone number and IP (Internet Protocol) address as information (suitably henceforth an initial entry) required for the management center 4 to access a user terminal 2 through a network 3 are also included in a registration demand message, and the communications control section 40 transmits them to the management center 4 through a network 3.

[0097] Since the registration completion message showing having carried out the management center 4 in this way, it having performed user registration processing mentioned later corresponding to the registration demand message transmitted from a user terminal 2, and user registration having completed it is transmitted there including the user-identification information for identifying a user terminal 2, the communications control section 40 judges whether the

registration completion message has been transmitted from the management center 4 in step S12.

[0098] In step S12, when judged [that a registration completion message has not been transmitted and], it returns to step S12. Moreover, when judged with the registration completion message having been transmitted (i.e., when the registration completion message transmitted from the management center 4 is received in the communications control section 40), it progresses to step S13 and the communications control section 40 makes the user-identification information included in the memory (not shown) to build in at the registration completion message memorize in step S12. Then, the communications control section 40 cuts a communication link with the management center 4, and ends registration demand processing.

[0099] Next, with reference to the flow chart of drawing 14 , the regeneration of musical piece data which a user terminal 2 performs is explained in full detail.

[0100] For example, if a control unit 42 is operated so that a user may set an optical disk 10 to a user terminal 2 and may perform the playback, a control section 41 will reproduce the musical piece data recorded there, contents identification information, improvement information identification information,

and improvement information from an optical disk 10 by controlling a required block in step S21. As mentioned above, musical piece data are memorized by the contents storage section 37, and contents identification information, improvement information identification information, and improvement information are memorized by the improvement information memory 38.

[0101] It progresses to step S22. And the improvement processing section 39 To raise the tone quality of the musical piece data memorized by the contents storage section 37 by referring to the improvement information identification information memorized by the improvement information storage section 38 When it judged whether there would be any improvement information on the type which run short and judges with there being nothing, Namely, the improvement information on all the types for raising the tone quality of the musical piece data memorized by the contents storage section 37 When it is already acquired by the improvement information acquisition processing mentioned later and the improvement information storage section 38 memorizes, step S23 thru/or S25 are skipped, and it progresses to step S26.

[0102] At step S26, the improvement processing section 39 raises the tone quality of the musical piece data memorized by the contents storage section 37

using the improvement information on all the types memorized by the improvement information storage section 38, progresses to step S27, outputs the musical piece data which raised the tone quality, and ends regeneration.

[0103] Therefore, the musical piece data whose tone quality improved in this case to the maximum extent are outputted.

[0104] moreover, in step S22, when judged with there being improvement information on the type which run short, it progresses to step S23 and a control section 41 judges whether the type which runs short of improvement information is required in the management center 4 (the management center 4 -- going -- other user terminals 2).

[0105] That is, a control section 41 displays on a display 43 the inquiry message which asks whether require improvement information, and judges whether improvement information is required based on a user's answer to the inquiry message.

[0106] Here, collection of the price as a countervalue to offer of the improvement information is performed so that it requires improvement information of the management center 4, and it may mention later in the management center 4, if improvement information is acquired in a user terminal 2. Therefore, since some

users may not wish acquisition of improvement information, in step S23, it judges whether improvement information is required.

[0107] In step S23, when judged with requiring improvement information (i.e., when a user operates a control unit 42 to an inquiry message so that improvement information may be required), improvement information acquisition processing which progresses to step S24 and is mentioned later is performed, and it progresses to step S25.

[0108] At step S25, the improvement information processing section 39 By improvement information acquisition processing performed at step S24 by referring to the improvement information storage section 38 When it judges with whether the improvement information on all types gathered, and it having judged and gathered (i.e., when the improvement information on all the types for raising the tone quality of the musical piece data memorized by the contents storage section 37 is memorized by the improvement information storage section 38), it progresses to step S26.

[0109] As mentioned above also in this case, at step S26, in the improvement processing section 39, the tone quality of the musical piece data memorized by the contents storage section 37 improves using the improvement information on

all the types memorized by the improvement information storage section 38, it progresses to step S27, the musical piece data which raised that tone quality are outputted, and regeneration is ended.

[0110] Therefore, the musical piece data whose tone quality improved also in this case to the maximum extent are outputted.

[0111] On the other hand, so that a user may not demand improvement information from an inquiry message Operate a control unit 42 and in step S23 by this [whether it is judged with not requiring improvement information, and] Or even if it performs improvement information acquisition processing of step S24, when it is judged with no improvement information on types having gathered in step S25 Progressing to step S28 in any case, the improvement processing section 39 is only the improvement information on the type now memorized by the improvement information storage section 38, and judges whether it is possible to perform improvement processing which raises the tone quality of musical piece data.

[0112] When judged with the ability of improvement processing not to be performed only for the improvement information on the type now memorized by the improvement information-storage section 38 in step S28, step S26 is skipped

and it progresses to step S27, and the musical piece data memorized by the contents storage section 37 are read, it outputs as it is, without performing improvement processing, and the improvement processing section 39 ends regeneration.

[0113] Therefore, the musical piece data of low tone quality or the usual tone quality are outputted in this case.

[0114] In step S28, only for moreover, the improvement information on the type now memorized by the improvement information storage section 38 When judged with it being possible to perform improvement processing, it progresses to step S26. The improvement processing section 39 The tone quality of the musical piece data memorized by the contents storage section 37 is raised using the improvement information on the type memorized by the improvement information storage section 38, it progresses to step S27, the musical piece data which raised the tone quality are outputted, and regeneration is ended.

[0115] Therefore, the musical piece data whose tone quality improved are outputted in the range of the improvement information memorized by the improvement information storage section 38 in this case.

[0116] Next, with reference to the flow chart of drawing 15 , the improvement

information acquisition processing in step S24 of drawing 14 is explained.

[0117] The communications control section 40 makes the communication link between the management centers 4 through a network 3 establish first. And in step S31, the communications control section 40 reads the contents identification information and improvement information identification information which were memorized by the improvement information storage section 38, and includes these in the improvement information-requirements message which requires improvement information. Furthermore, the communications control section 40 reads the user-identification information memorized by that memory to build in, and this user-identification information is also included in a registration demand message, and it transmits it to the management center 4 through a network 3.

[0118] In the management center 4 which received the improvement information-requirements message It is judged whether offer of the improvement information demanded by the improvement information-requirements message is possible so that it may mention later. In being possible In not being possible, since it transmits to a user terminal 2 through a network 3, the offer improper message which expresses that for the improvement information, respectively in

the communications control section 40 In step S32, it is judged whether the offer improper message has been transmitted from the management center 4.

[0119] In step S32, when judged with the offer improper message having been transmitted (i.e., when the offer improper message from the management center 4 is received in the communications control section 40), the communications control section 40 cuts a communication link with the management center 4, skips step S33 thru/or S35, and ends improvement information acquisition processing (a return is carried out).

[0120] Moreover, when judged with an offer improper message not having been transmitted in step S32, Namely, information with the improvement information required for others demanded by the improvement information-requirements message (For example, with the improvement information identification information for identifying the improvement information, the contents identification information for identifying the musical piece data whose tone quality improves using the improvement information, etc.) When transmitted from the management center 4, it progresses to step S33, the communications control section 40 receives the improvement information from the management center 4 etc., and it judges whether the normal reception was able to be

performed.

[0121] In a user terminal 2, before the judgment of whether to have been able to carry out normal reception of the information from the management center 4 transmits information from the management center 4, it can be carried out here by having the size of the information to transmit transmitted and comparing the size with the size of the information actually received from the management center 4.

[0122] In step S33, when judged with the ability of normal reception of the improvement information from the management center 4 etc. to have not been performed, it progresses to step S34 and the communications control section 40 requires resending of improvement information etc. from the management center 4. And the same processing is repeated return and the following to step S33.

[0123] Moreover, in step S33, when judged with the ability of normal reception of the improvement information from the management center 4 etc. to have been performed, it progresses to step S35, and the communications control section 40 makes the improvement information storage section 38 supply and memorize the improvement information which carried out normal reception, and

progresses to step S36. At step S36, the communications control section 40 transmits the normal received message showing what normal reception was able to carry out to the management center 4, cuts a communication link with the management center 4 after that, and ends improvement information acquisition processing.

[0124] In addition, the above improvement information acquisition processings are performed in the regeneration shown in drawing 14 , and also they can be carried out according to a demand of a user.

[0125] Next, by the improvement information-requirements message from a user terminal 2, if improvement information is required, the management center 4 will acquire the improvement information from other user terminals 2, and will provide with it the user terminal 2 which has required improvement information. This will provide the management center 4 with improvement information, if it sees from other user terminals 2.

[0126] Then, with reference to the flow chart of drawing 16 , improvement information offer processing in which a user terminal 2 provides the management center 4 with improvement information is explained.

[0127] If a demand of the improvement information transmitted from the

management center 4 is received, by the user terminal 2, in step S41, as it mentioned above, playback of an optical disk 10 is performed, and as the communications control section 40 mentions later, while musical piece data are memorized by the contents storage section 37, thereby, contents identification information, improvement information identification information, and improvement information will be memorized by the improvement information storage section 38.

[0128] And with the user-identification information recorded on the memory which it progresses to step S42, and the communications control section 40 reads the contents identification information memorized by the improvement information storage section 38, improvement information identification information, and improvement information, among those is harbored, it transmits to the management center 4 and progresses to step S43.

[0129] At step S43, when judged with the communications control section 40 having judged whether the resending demand would have been transmitted, and having been transmitted from the management center 4, the same processing as an above-mentioned case is repeated return and the following to step S42.

[0130] Moreover, in step S43, when judged with a resending demand not having

been transmitted from the management center 4, improvement information offer processing is ended.

[0131] Next, drawing 17 shows the example of a configuration of the management center 4 of drawing 1 .

[0132] It receives the data from a network 3 and supplies them to the registration section 52, the acquisition section 54, or the offer section 56 while the communications control section 51 performs communications control through a network 3, receives required data from the registration section 52, the acquisition section 54, or the offer section 56 and transmits to a network 3.

[0133] The registration section 52 stores information required for user registration in the user database 53 and the accounting database 59 based on the data supplied from the communications control section 51. Moreover, in user registration, the registration section 52 publishes user-identification information, and supplies it to the communications control section 51.

[0134] The user database 53 matches and memorizes information required for the user-identification information published to the user terminal 2.

[0135] The acquisition section 54 performs control for acquiring improvement information from a user terminal 2 based on the data supplied from the

communications control section 51. That is, the acquisition section 54 recognizes the user who owns the optical disk 10 with which required improvement information is recorded by controlling the retrieval section 57. Furthermore, the acquisition section 54 acquires improvement information etc. and memory 55 is made to supply and memorize it from the user's user terminal 2 by controlling the communications control section 51. Moreover, the acquisition section 58 supplies the user-identification information which identifies the user terminal 2 which acquired improvement information etc. to the accounting section 58.

[0136] Memory 55 stores temporarily the improvement information supplied from the acquisition section 54.

[0137] The offer section 56 makes the improvement information etc. transmit to a user terminal 2 by reading the improvement information memorized by memory 55 and controlling the communications control section 51. Moreover, the offer section 56 supplies the user-identification information which identifies the user terminal 2 which offered improvement information to the accounting section 58.

[0138] According to control of the acquisition section 54, the retrieval section 57 searches the user database 53, and supplies the information (User Information)

about the user who owns required improvement information to the acquisition section 54.

[0139] the accounting section 58 -- the acquisition section 54 or the offer section 56 -- respectively -- since -- accounting to the user of the user terminal 2 specified using the user-identification information supplied is performed, referring to the accounting database 59. The accounting database 59 memorizes accounting information required for the accounting of the accounting section 58.

[0140] In the management center 4 constituted as mentioned above, if a registration demand message is transmitted from a user terminal 2 as drawing 13 explained, user registration processing according to the flow chart of drawing 18 will be performed.

[0141] That is, it is received in the communications control section 51, and the registration demand message transmitted from a user terminal 2 is supplied to the registration section 52. If a registration demand message is received, in step S51, the registration section 52 will publish unique user-identification information, and will progress to step S52. At step S52, the registration section 52 matches the contents identification information contained in a registration demand

message from the communications control section 51, improvement information identification information, and an initial entry with the user-identification information published at step S51, considers as User Information, and supplies and registers the User Information into the user database 53.

[0142] And it progresses to step S53, and the registration section 52 creates the entry for memorizing the accounting information of the user corresponding to the user-identification information published at step S51 in the accounting database 59, and progresses to step S54.

[0143] At step S54, supply the registration section 52 to the communications control section 51, it makes the user terminal 2 which has transmitted the registration demand message transmit the registration completion message including the user-identification information published at step S51 to the registration completion message showing user registration having been completed, and ends user registration processing.

[0144] Next, the management center 4 explains this improvement information junction processing with reference to the flow chart of drawing 19 , although the processing (suitably henceforth improvement information junction processing) which will acquire that improvement information from 2m of other user terminals

which finished user registration, and will provide user-terminal 2k with it from user-terminal 2k which finished user registration if there is a demand of improvement information is carried out as mentioned above.

[0145] If an improvement information-requirements message is transmitted to the management center 4 from user-terminal 2k as drawing 15 explained, the improvement information-requirements message will be received in the communications control section 51, and improvement information junction processing will be started.

[0146] That is, the communications control section 51 supplies the improvement information-requirements message which received to the acquisition section 54, and the acquisition section 54 recognizes the improvement information demanded in step S61 based on the improvement information-requirements message.

[0147] Here, as mentioned above, contents identification information and improvement information identification information are contained in the improvement information-requirements message. And according to contents identification information, in user-terminal 2k which has transmitted the improvement information-requirements message, the musical piece data which

are going to raise tone quality can be specified, and in user-terminal 2k which has transmitted the improvement information-requirements message, the type of the improvement information which already exists can be specified according to improvement information identification information. Therefore, it is improvement information required to raise the tone quality of the musical piece data which are going to raise tone quality in the improvement information which user-terminal 2k which has transmitted the improvement information-requirements message requires, i.e., user-terminal 2k, from the contents identification information contained in an improvement information-requirements message, and improvement information, and what is not in user-terminal 2k (what is not memorized by the improvement information storage section 38 (drawing 12)) can be recognized.

[0148] In step S61, if the improvement information which user-terminal 2k is demanding is recognized, the acquisition section 51 will progress to step S62, and will control the retrieval section 57 to search the user terminal 2 which owns the improvement information.

[0149] This searches the retrieval section 57 by referring to the user database 53 for the user terminal 2 which owns the improvement information which

user-terminal 2k is demanding. That is, by referring to the contents identification information and improvement information identification information which are memorized by the user database 53, the retrieval section 57 retrieves the user-identification information on the user terminal 2 which owns the improvement information which user-terminal 2k is demanding, and supplies the retrieval result to the acquisition section 54.

[0150] The acquisition section 54 is based on a retrieval result from the retrieval section 57 in step S63. In the retrieval section 57 when it judges with whether the user terminal 2 which owns the improvement information which user-terminal 2k is demanding exists, and it not judging and existing When the user-identification information on the user terminal 2 which owns the improvement information which user-terminal 2k is demanding is not acquired, it progresses to step S64. The acquisition section 54 By controlling the communications control section 51, the offer improper message of the purport which cannot require improvement information is made to transmit to user-terminal 2k which has required improvement information, and improvement information junction processing is ended.

[0151] Moreover, when judged with the user terminal 2 which owns the

improvement information which user-terminal 2k is demanding in step S63 existing, it sets in the retrieval section 57. When the user-identification information on the user terminal 2 which owns the improvement information which user-terminal 2k is demanding is acquired, it progresses to step S65. The acquisition section 54 By controlling the communications control section 51, the identification information which user-terminal 2k is demanding of 2m of user terminals specified using the user-identification information acquired in the retrieval section 57 is required.

[0152] That is, in this case, based on the initial entry matched with the user-identification information acquired in the retrieval section 57, that user establishes a 2m [of user terminals specified by identification information] communication link, and the communications control section 51 requires the improvement information which user-terminal 2k is demanding.

[0153] Here, the user terminal 2 from which the improvement information which user-terminal 2k is demanding recognizes two or more type existence, and differs the two or more types of each improvement information further may own. in this case, the processing to step S68 mentioned later from step S65 -- that different user terminal 2 -- it is carried out about each.

[0154] Moreover, although two or more user terminals 2 which own a certain type of improvement information which user-terminal 2k is demanding may exist, in this case, improvement information chooses one from two or more of those user terminals 2, and can require it. There is an approach choose the user terminal 2 which becomes the cheapest as the selection approach which chooses one from two or more user terminals 2, others, for example, traffic. [approach / of choosing one user terminal 2 as arbitration] Moreover, communication link quality is able to choose the best user terminal 2.

[0155] Furthermore, when two or more user terminals 2 which own a certain type of improvement information exist, as mentioned above, it is also possible to choose two or more [containing the all] rather than to to choose one from two or more of the user terminals 2. the case where two or more user terminals 2 are chosen -- the two or more user terminals 2 -- respectively -- since -- every [of improvement information same type / a part] can be acquired. moreover, the case where two or more user terminals 2 are chosen -- those two or more user terminals 2 -- respectively -- since -- it is also possible to acquire all the same improvement information, and it can raise the robustness of improvement information in this case. namely, -- case communication link quality is bad -- two

or more user terminals 2 -- respectively -- since -- even if an error arises during transmission and reception of improvement information by acquiring all the same improvement information, the error can be corrected and exact improvement information can be acquired.

[0156] In addition, in order to simplify explanation, when two or more user terminals 2 which own a certain type of improvement information exist, 2m of one user terminal shall be chosen from two or more of the user terminals 2, and the gestalt of this operation shall require improvement information from 2m of the one user terminal in step S65, as mentioned above.

[0157] When a demand of improvement information is transmitted to 2m of user terminals and a demand of the improvement information is received in step S65, in 2m of the user terminal 2m of user terminals Since the improvement information demanded at step S65 from the management center 4 is transmitted with the improvement information identification information, contents identification information, and user-identification information by performing improvement information offer processing in which it explained by drawing 16 The communications control section 51 receives the improvement information transmitted by making it such.

[0158] And it progresses to step S66 and the communications control section 51 judges whether normal reception of the improvement information from 2m of user terminals etc. was able to be carried out. In step S66, when judged with the ability of normal reception of the improvement information from 2m of user terminals etc. to have not been carried out, it progresses to step S67, and to 2m of user terminals, the communications control section 51 transmits a resending demand, and returns to step S65.

[0159] Moreover, in step S66, when judged with the ability of normal reception of the improvement information from 2m of user terminals etc. to have been carried out, the communications control section 51 supplies the improvement information which carried out normal reception to the acquisition section 54. The acquisition section 54 makes memory 55 supply and memorize the improvement information etc., when improvement information etc. is received from the communications control section 51. And the acquisition section 54 supplies the user-identification information on 2m of user terminals transmitted with improvement information to the accounting section 58, thereby, makes accounting perform in the accounting section 58, and makes the accounting information of the accounting database 59 to progress to step S68 and update.

[0160] That is, while the accounting section 58 reads the accounting information specified using the user-identification information from the acquisition section 54 from the accounting database 59 in this case, the price which should be paid to the improvement information acquired from 2m of user terminals is computed. Furthermore, the accounting section 58 adds the computed price to the accounting information read from the accounting database 59, and writes in the new accounting information obtained by this in the form which overwrites the accounting database 59.

[0161] Then, it progresses to step S69, and from memory 55, the offer section 56 reads improvement information with the improvement information identification information and contents identification information, is controlling the communications control section 51, makes the improvement information etc. transmit to user-terminal 2k, and progresses to step S70.

[0162] In this case, since user-terminal 2k transmits a resending demand or a normal received message as improvement information acquisition processing of drawing 15 explained, at step S70, the communications control section 51 judges any shall have been transmitted between a resending demand or a normal received message from user-terminal 2k. In step S70, when judged with

the resending demand having been transmitted, return, the improvement information memorized by memory 55 by this are resent to step S69.

[0163] Moreover, in step S70, when judged with the normal received message having been transmitted, it progresses to step S71, and the user-identification information on user-terminal 2k which transmitted improvement information (offer) is recognized from the improvement information-requirements message received in the communications control section 51, and the offer section 56 supplies it to the accounting section 58. Thereby, the accounting section 58 performs accounting, updates the accounting information of the accounting database 59, and ends improvement information junction processing.

[0164] That is, while the accounting section 58 reads the accounting information specified using the user-identification information from the offer section 56 from the accounting database 59 in this case, the price which should be collected to the improvement information offered to user-terminal 2k is computed. Furthermore, the accounting section 58 subtracts the computed price from the accounting information read from the accounting database 59, and writes in the new accounting information obtained by this in the form which overwrites the accounting database 59.

[0165] In addition, periodically or irregularly after that, according to the accounting information memorized by the accounting database 59, the accounting section 58 transfers the money as a charge of information offer of improvement information to a user's bank account, or charges directly the price as a charge of purchase of improvement information to a bank account.

[0166] For example, accounting in the accounting section 58 can be carried out as follows here.

[0167] namely, as drawing 4 explained, in, using what divided the lower bit of the original data of musical piece data into plurality as improvement information for example A thing with the high (needs are high) probability for the probability to provide other user terminals 2 with the lower bit of the lower bits as the improvement information to provide other user terminals 2 with the high order bit of the lower bits as improvement information low (for needs to be) is expected. Then, the price to offer of the lower bit of the lower bits as improvement information can be set as a large sum, and the price to offer of the high order bit of the lower bits as improvement information can be set as a small amount. Furthermore, it is also possible to set the purchase price of the optical disk 10 with which the lower bit of the lower bits as improvement information is recorded

in this case as a small amount, and to set the purchase price of the optical disk 10 with which the high order bit of the lower bits as improvement information is recorded as a large sum. In this case, since the improvement information that the probability demanded from other user terminals 2 is high is recorded on that optical disk 10 even if an optical disk 10 is a large sum, the user who purchased that optical disk 10 can regain some or all of a price that was paid for the large sum optical disk 10 by the charge of information offer by offering improvement information.

[0168] In the management center 4, it is made not to perform accounting, namely, the purchase price of the charge of information offer of improvement information and improvement information is made into no charge. Further moreover, about the price of an optical disk 10 An above-mentioned case is possible also for setting the purchase price of the optical disk 10 with which the lower bit of the lower bits as improvement information is recorded on reverse as a large sum, and setting the purchase price of the optical disk 10 with which the high order bit of the lower bits as improvement information is recorded as a small amount. In this case, although the optical disk 10 with which the improvement information that the probability demanded from other user terminals 2 is high is

recorded is a small amount Although the optical disk 10 with which the improvement information that the probability which becomes what needs to provide the part and other user terminals 2 with the improvement information currently recorded there frequently, and is demanded from other user terminals 2 is low is recorded is a large sum It is not necessary to provide the part and other user terminals 2 with the improvement information currently recorded there so much.

[0169] In addition, when accounting was performed in the management center 4, as it mentioned above, when acquiring improvement information same type from two or more user terminals 2, to two or more of the user terminals 2, the price of the frame which divided equally the price paid when improvement information is acquired from one user terminal 2 can be paid, for example.

[0170] As mentioned above, the user-identification information which identifies a user terminal 2 in the management center 4, User Information containing the improvement information identification information which identifies the improvement information currently recorded on the optical disk 10 processed in the user terminal 2 It registers with the user database 53. From a certain user-terminal 2k Based on User Information, search 2m of other user terminals

which can offer required improvement information when there is a demand of improvement information, and improvement information is acquired from 2m of the user terminal of the searched others. Since it was made to provide for user-terminal 2k, by users, it becomes possible to deal in improvement information for raising the data quality which self purchased, consequently expansion of a new commercial scene and offer of new service are attained.

[0171] Next, hardware can also perform a series of processings mentioned above, and software can also perform. When software performs a series of processings, the program which constitutes the software is installed in a general-purpose computer etc.

[0172] Then, drawing 20 shows the example of a configuration of the gestalt of 1 operation of the computer by which the program which performs a series of processings mentioned above is installed.

[0173] A program is recordable on the hard disk 105 and ROM103 as a record medium which are built in the computer beforehand.

[0174] Or a program is permanently [temporarily or] storable in the removable record media 111, such as a floppy (trademark) disk, CD-ROM (Compact Disc Read Only Memory), MO (Magneto optical) disk, DVD (Digital Versatile Disc), a

magnetic disk, and semiconductor memory, again (record). Such a removable record medium 111 can be offered as the so-called software package.

[0175] In addition, it installs in a computer from the removable record medium 111 which was mentioned above, and also from a download site, through the satellite for digital satellite broadcasting services, it transmits to a computer on radio, or a program is transmitted to a computer with a cable through networks, such as LAN (Local Area Network) and the Internet, and by computer, it can receive in the communications department 108 and it can install the program transmitted by making it such on the hard disk 105 to build in.

[0176] The computer contains CPU (Central Processing Unit)102. The input/output interface 110 is connected to CPU102 through the bus 101, and the input section 107 from which CPU102 is constituted from a keyboard, a mouse, a microphone, etc. by the user through an input/output interface 110 will perform the program stored in ROM (Read Only Memory)103 according to it, if a command is inputted by [, such as actuation,] being carried out. Or it is transmitted from the program and satellite with which CPU102 is stored in the hard disk 105 again, or a network, and the program which was received in the communications department 108 and installed on the hard disk 105, or the

program which reading appearance was carried out from the removable record medium 111 with which the drive 109 was equipped, and was installed on the hard disk 105 is loaded to RAM (Random Access Memory)104, and is performed. Thereby, CPU102 performs processing performed by the configuration of the block diagram according to the flow chart mentioned above processed or mentioned above. and the output from the output section 106 by which CPU102 is constituted from LCD (Liquid CryStal Display), a loudspeaker, etc. through an input/output interface 110 in the processing result if needed or the transmission from the communications department 108 -- record etc. is further carried out to a hard disk 105.

[0177] It is not necessary to necessarily process the processing step which describes the program for making various kinds of processings perform to a computer in this description here to time series in accordance with the sequence indicated as a flow chart, and it is a juxtaposition thing also including the processing (for example, parallel processing or processing by the object) performed according to an individual.

[0178] Moreover, a program may be processed by the computer of 1 and distributed processing may be carried out by two or more computers.

Furthermore, a program may be transmitted to a distant computer and may be executed.

[0179]

[Effect of the Invention] According to the program documentation medium, the improvement information on other one or more data sets is required of the 1st information processor of this invention and the information processing approach, and a list, and the data quality of a data set improves using the improvement information acquired as a result of the demand, and the improvement information on a data set. Therefore, dealing of improvement information is attained.

[0180] According to the program documentation medium, the improvement information on a data set is reproduced by the 2nd information processor of this invention and the information processing approach, and the list, and they are provided with the reproduced improvement information according to the demand of other information processors. Therefore, dealing of improvement information is attained.

[0181] According to the program documentation medium, User Information containing the user-identification information which identifies a user terminal,

and the improvement information identification information which identifies the improvement information on the data set processed in the user terminal is registered into the 3rd information processor of this invention and the information processing approach, and a list. Moreover, other user terminals which can offer required improvement information when there is a demand of improvement information are searched from a user terminal based on User Information, and improvement information is acquired from the user terminal of the searched others. And the user terminal which has required the improvement information is provided with the acquired improvement information. Therefore, dealing of improvement information between the users of a user terminal is attained.

[0182] Since the improvement information for raising the data quality recorded on other data-logging media with the data quality currently recorded on self is recorded according to the data-logging medium of this invention, dealing of improvement information is attained among the users which purchased this data-logging medium.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is drawing showing the example of a configuration of the gestalt of 1 operation of the network system which applied this invention.

[Drawing 2] It is drawing showing the data format of the data which the contents provider 1 offers.

[Drawing 3] It is drawing showing a format of IRSC.

[Drawing 4] It is drawing showing the example of improvement information.

[Drawing 5] It is drawing showing the original data of a musical piece.

[Drawing 6] It is drawing showing the data which carried out subsampling of the original data of a musical piece.

[Drawing 7] It is drawing showing the data which carried out subsampling of the original data of a musical piece.

[Drawing 8] It is drawing showing the data which carried out subsampling of the original data of a musical piece.

[Drawing 9] It is drawing showing the data which carried out subsampling of the original data of a musical piece.

[Drawing 10] It is a flow chart explaining the production process of an optical disk 10.

[Drawing 11] It is drawing explaining the exchange of the improvement information between user-terminal 2 performed via the management center 4.

[Drawing 12] It is the block diagram showing the example of a configuration of a user terminal 2.

[Drawing 13] It is a flow chart explaining the registration demand processing by the user terminal 2.

[Drawing 14] It is a flow chart explaining regeneration of the optical disk 10 by the user terminal 2.

[Drawing 15] It is a flow chart explaining the detail of the improvement information acquisition processing by the user terminal 2.

[Drawing 16] It is a flow chart explaining the improvement information offer processing by the user terminal 2.

[Drawing 17] It is the block diagram showing the example of a configuration of the management center 4.

[Drawing 18] It is a flow chart explaining the user registration processing by the management center 4.

[Drawing 19] It is a flow chart explaining the improvement information junction processing by the management center 4.

[Drawing 20] It is the block diagram showing the example of a configuration of the gestalt of 1 operation of the computer which applied this invention.

[Description of Notations]

1 Contents Provider 21 thru/or 2Ns User Terminal 3 Network, 4 Management Center 10 Record Medium (Optical Disk), 31 Spindle motor section 32 optical pickup 33 The RF amplifier section, 34 CD processor section 35 A driver, 36

Thread motor section 37 Contents storage section 38 Improvement information storage section 39 Improvement processing section 40 Communications control section 41 control sections 42 Control unit 43 Display 51 The communications control section, 52 Registration section 53 A user database, 54 Acquisition section 55 Memory, 56 offer section 57 Retrieval section 58 accounting section 59 An accounting database and 101 buses, 102 CPU 103 ROM, 104 RAM 105 hard disks, 106 Output section 107 Input section 108 The communications department, 109 Drive 110 Input/output interface 111 Removable record medium